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Cooperative superconductivity R&D efforts expand
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# BAYER R&D

Pharmaceuticals are target of separate but integrated management Page 9

CHEMICAL & ENGINEERING NEWS

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# LETTERS

## Scientific literacy

SIR: I endorse the letter from Ephraim Banks (C&EN, May 22, page 2) regarding scientific literacy. I agree that the grade school teacher population is the major one to approach for the interest level, and the [grade school] portion of the curriculum is the one that needs stimulus.

When young children are stimulated and find something interesting and/or fun they usually continue to pursue it. Therefore, the earlier that one starts to do this the more likely the ultimate benefit.

At the present time we are, unfortunately, looking at something that may take 10 to 15 years to reverse, because the current school systems are reasonably embedded in technique rituals that do take time to modify usefully.

**H. William Gillen**
*Clinical Professor, Neurology*
*University of North Carolina, Wilmington*

## Health and environment

SIR: No reasonable person can doubt the need for rigorous science in considerations of health and the environment. But sometimes the appeal for such rigor has been misused so transparently, it understandably leads to skepticism as to the honesty of some industries and their spokesmen, who flout what should be the motivating idea of prudent persons: When important health or environmental issues are at stake, assume the worst even in the absence of definitive studies.

To be sure, economically costly mistakes may sometimes be made. (Has that ever occurred?) But the alternative is, ultimately, to take the cynic's point of view, which one such person expressed to me as, "I don't care what happens after I die." Indeed, the list of major issues, most of which have been resolved on the side of prudence, is almost frighteningly long: the effect of smoking on health and longevity, the destruction of the ozone layer by CFCs, the hazards of pesticides, the influence of phosphates on eutrophication, toxic landfills such as Love Canal, the effect of agent orange on those exposed to it, the health consequences of intrauterine devices, the safety of certain topical antimicrobials, the safety of nuclear reactors, and on and on.

In every instance, the immediate posture taken by industry was to deny the allegations of harm. I surely do not advocate abandoning the requirement of sound epidemiological studies. But I do advocate, when good epidemiological data are unavailable and there is good reason to question safety, that society take the most conservative view: Health and the environment must take precedence over profit. To do otherwise is not merely to betray whatever trust laymen still place in science, but often to condemn the innocent to injury and even death. It is, by now, commonplace that lay persons rely less and less on the assurances given them by scientists. Is it any wonder, given the magnitude and seriousness of the problems cited above, that science is suffering what can appropriately be called a credibility gap?

By automatically advocating the positions taken by their industries in questions of social concern, positions that almost always deride accusatory evidence about the safety of products or operations, some industrial scientists have abrogated the charge invested in them by their training and presumed dedication: Be fair to all the facts. To compel the innocent to suffer the possible hazardous consequences of what all too often are no more than guesses as to presumed safety is not merely arrogant, but possibly criminal.

**David Taber**
*Chicago*

## Laboratory organic chemistry

SIR: The Science/Technology section reports on the new developments in the teaching of laboratory organic chemistry (C&EN, May 8, page 32). The movement to microscale is undergoing rapid growth and wide acceptance throughout the academic community. Kenneth Williamson's text attempts to bridge the gap between those who require some macro techniques, but want to introduce a significant number of micro experiments to their students.

The article gave credit to the role of Ace Glass and Kontes for producing specialized microscale glassware, but failed to mention that Pfaltz & Bauer Inc. has been endorsed by Dana Mayo as well as by Williamson to prepare chemicals in kit form for all the microscale experiments in their texts.

The kits are prepared in sets for 10, 20, and 30 students, with a 30% excess. All

### Correction

• June 26, page 35: In box, the Program for Alternative Fluorocarbon Toxicity Testing's third effort, PAFTT III, will examine HCFC-124 ($C_2HClF_4$) and HFC-125 ($C_2HF_5$), not CFC-115 and HCFC-22.

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# Chemical trade with communist nations climbs

Chemicals have become an important part of U.S. exports to communist countries. The converse, however, is a different story. Still, exports to communist countries play only a minor role in the overall U.S. chemical export picture.

U.S. chemical exports, for instance, have accounted for an average 10% of total U.S. exports over the past few years. Last year, when chemical exports hit a record $32.3 billion, they amounted to 11% of all U.S. exports.

However, when the markets are communist countries, chemicals account for a hefty 20% of U.S. exports. Chemicals, in fact, are the third largest product category that the U.S. ships to communist customers, exceeded only by food and machinery and transport equipment.

According to a recent study by the International Trade Commission, U.S. chemical exports to communist nations increased a whopping 50% in 1988 over 1987 to $1.73 billion. That growth rate is almost twice that for total chemical exports.

Despite these impressive numbers, communist countries take a relatively small, but growing, slice of all the chemicals that the U.S. exports. In 1988, communist countries accounted for only 5.4% of total U.S. chemical exports, up from 4.4% in 1987.

In terms of chemical imports, trade with communist countries is almost nonexistent. Although chemical imports from these countries increased 25% last year, they still accounted for only 4% of total shipments from communist countries. And, at only $447 million, they represented a paltry 2.3% of all chemicals imported into the U.S. in 1988.

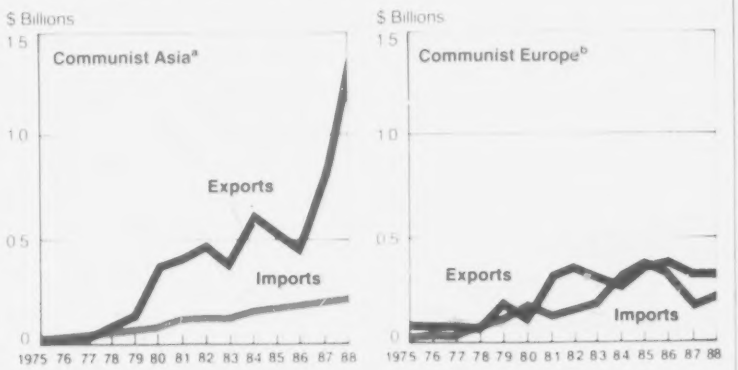
The result is a lopsided chemical trade surplus for the U.S. with communist nations. Last year that surplus swelled to $1.3 billion, up substantially from $799 million in 1987. In 1986, the chemical trade surplus with these communist countries was only $330 million.

Over the past few years, China has emerged as the leading communist trading partner with the U.S. China alone buys almost 58% of total U.S. exports to communist countries and 80% of the chemical exports. Trade with the Soviet Union pales by comparison, with 32% of total exports and 16% of chemical exports.

China is also the leader on the import side of the ledger. It accounts for almost 80% of total U.S. imports from communist countries and for more than half of all chemical imports from communist sources.

Last year, U.S. chemical exports to China increased 72% from 1987 to $1.4 billion. That represents a surprising 28% of all U.S. exports to that country. Two products alone—fertilizer and polypropylene—ac-

**U.S. chemical trade with communist Asia grows faster, is much larger than with communist Europe**




a Includes China. b Includes U.S.S.R. Sources

counted for almost half of those chemical exports. In an attempt to boost its own grain output, which remained well below the record 1984 harvest, China increased its imports of U.S. fertilizer last year 40% to $379 million.

U.S. plastics and resins exports to China soared 134% last year to $595 million. This huge increase reflects China's growing demand for plastics and resins in the agricultural sector (particularly sheeting) and industry. The country imported $301 million of polypropylene, $64 million of low-density polyethylene, $55 million of acrylonitrile-butadiene-styrene resins, and $51 million of high-density polyethylene.

U.S. organic chemicals also figured heavily on China's shopping list. Its imports of these materials from the U.S. increased 71% last year to $256 million. Largest export item in this category: carboxylic acids, anhydrides, and their derivatives.

Compared with China, the Soviet Union is a relatively small customer for U.S. chemical exports. Last year, those exports amounted to only $273 million and represented only 10% of total U.S. exports to the U.S.S.R. The big-ticket items among U.S. shipments to the U.S.S.R., as usual, were grains—corn, wheat, soybeans—as well as soybean oil cake and meal. Of the $273 million in chemicals exported to the Soviet Union last year, almost 82% was fertilizer. The only other chemical export of any significance was $12 million worth of catalyst preparations.

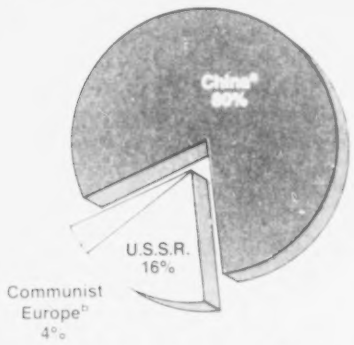
U.S. imports from the U.S.S.R. hit $563 million last year, but most of that was petroleum and petroleum products. Chemical imports were only $116 million. Still, that amounts to 21% of total imports from the U.S.S.R. Three products account for the bulk of the Soviet Union's chemical shipments to the U.S. By far the largest is anhydrous ammonia ($63 million in 1988), followed by crude potassium chloride ($24 million) and uranium compounds ($9 million).

Aside from China, U.S. chemical trade with communist Asia is virtually nonexistent. But the U.S. did export $69 million worth of chemicals to Eastern European nations (excluding the U.S.S.R.) and imported $101 million in chemicals. This means that Eastern Europe is the only communist area that enjoys a chemical trade surplus with the U.S.

Of the Soviet-aligned European countries, Poland overshadows all others as a market for U.S. chemicals. It bought $32 million worth last year, 46% of the total for Eastern Europe (excluding the U.S.S.R.). Poland also accounts for 30% of the chemicals that the U.S. imports from Eastern Europe.

*Earl Anderson*

## China leads communist nations in chemical trade with U.S.




1988 U.S. chemical exports to communist countries = $1.73 billion

1988 U.S. chemical imports from communist countries = $447 million

a U.S. trade is exports to and imports from China and Taiwan. b Excludes U.S.S.R. c U.S. shipping imports from and exports to Asia. Source: International Trade Commission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